

WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY
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Note to Readers: Pages 1-13 comprise the summary and analysis of this report. Expanded details for some items that might not be available via the Internet are in the Appendix.

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Item 1. Improving Effectiveness of Multilateral Environmental Agreements

The High-Level Meeting on Compliance with and Enforcement of Multilateral Environmental Agreements (MEAs), organized by UNEP, took place in Colombo, Sri Lanka, 21-22 January. The meeting reviewed and assessed the problems impeding the full implementation of MEAs and the best procedures to help governments comply with their obligations under the various international treaties for protecting the global environment. In addition to looking into the technical aspects of compliance, the meeting also explored new legal, structural, and institutional improvements, such as synergies, inter-linkages, and clustering of MEAs. The draft Chair's Summary identifies 23 challenges grouped in 3 categories (institutional structures; interlinkages; and instruments to improve implementation) that need further consideration, capacity building, and resources. The Summary will serve UNEP in developing an action plan to improve MEAs' compliance and enforcement. The plan is expected to be presented to the UNEP Governing Council in 2007.

Note: The UNU Inter-Linkages Initiative helps the governments of 14 Asian and Pacific Countries understand and implement multilateral environmental agreements at national and regional levels <http://www.unu.edu/inter-linkages> [See *Developing countries' compliance with environmental regulations is expected to improve via new modes of international assistance* in January 2003 environmental security report]

Military Implications:

There is a growing willingness to create a coherent structure for the MEAs, which could lead to modifications that would affect the military. Since the Chair's Summary states "compliance with and implementation of the obligations contained in MEAs are directly related to the political, economic, social and legal acceptability of those obligations to the Parties," the military, due to its know-how and as part of its Army Strategy for the Environment, should consider contributing input to the development of the action plan and new compliance and enforcement strategies. Increases in international compliance discipline will affect scrutiny of military environmental management.

Sources:

Envisioning the Next Steps for MEA Compliance and Enforcement

http://www.unep.org/dec/support/mdg_meeting_col.htm

MEA Enforcement and Compliance Meeting Bulletin

<http://www.iisd.ca/ymb/unepmea/ymbvol121num1e.html>

Item 2. China and India Sign Precedent-Setting Energy Agreement

How the world prepares for the advent of "peak oil," will be a major factor in determining the future of war and peace. Will the major consumers and producers plan for the peaceful decline in oil and gas supplies or...? India and China have decided to cooperate and have signed the "Memorandum for Enhancing Cooperation in the Field of Oil and Natural Gas" which outlines comprehensive cooperation concerning hydrocarbons, including trading and joint bidding in third countries; research and development; exploration and production; conservation; and promotion of environment-friendly energy. A joint committee will be established to monitor implementation and facilitate dialogue and information sharing. This new agreement is in addition to the two

nations' previous commitments to cooperate for accelerating the development of new energy sources.

Military Implications:

Military planners should use this precedent to explore possibilities for a more global agreement for the peaceful management of the "oil peak" transition. Since conservation is one of the areas included in the Memorandum for Enhancing Cooperation, it is likely that some regulations and enforcements might follow. The military should closely follow new developments and outcomes of the Memorandum and see how they might affect its planning and actions.

Sources:

China, India sign energy agreement

http://www.chinadaily.com.cn/english/doc/2006-01/13/content_511871.htm (article stored for a limited time on the website; full text in the [Appendix](#))

Petroleum Minister's Opening Remarks At The Delegation Level Talks With Chairman, NDRC Of China <http://pib.nic.in/release/release.asp?relid=14918>

Sino-India energy accord difficult in practice: analysts

http://www.dailytimes.com.pk/default.asp?page=2006%5C01%5C14%5Cstory_14-1-2006_pg5_24

Energy Efficiency Guide for Asian Industries Debuts in Bangkok

<http://www.ens-newswire.com/ens/jan2006/2006-01-18-03.asp>

Take your partners. *The Economist*, Jan 19th 2006

http://www.economist.com/research/articlesBySubject/displayStory.cfm?story_id=5420659&subjectID=381586&fsrc=nwl&emailauth=%2527%252E5%252F4Q%252CKH%2521A%25244%250A (by subscription only; full text in the [Appendix](#))

State of the World 2006: China and India Hold World in Balance

<http://www.worldwatch.org/press/news/2006/01/11/>

Item 3. International Year of Deserts and Desertification—2006

The UN has declared 2006 the International Year of Deserts and Desertification to help raise global public awareness of the threat that advancing deserts and desertification represent to humanity, and consequently to increase efforts to explore ways to cope, counter, or even reverse these phenomena. "...desertification has been seen as a threat to human security," notes UN Convention to Combat Desertification Executive Secretary, Hama Arba Diallo. The southern progression of the Sahara increases famine and migration, escalating conflicts across Africa. December 2006 is the 10th anniversary of the UN Convention to Combat Desertification with 191 states parties.

Military Implications:

Those developing military programs to prevent environmentally induced conflicts should take advantage of the Year to cooperate with other militaries, international agencies, and NGOs to create new policies and strategies to counter desertification and help cope with its consequences.

Sources:

2006 International Year of Deserts and Desertification

<http://www.iydd.org/>

Life Saving Anti-Drought Measures Must Include Investment in Nature

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=467&ArticleID=5077&l=en>

INTERVIEW: Advancing deserts fuel African conflicts

<http://www.alertnet.org/thefacts/reliefresources/113804548788.htm>

In Kenya, 'Why Does This Keep Happening?'

By Emily Wax, Washington Post Foreign Service, January 8, 2006; Page A20

<http://www.washingtonpost.com/wp-dyn/content/article/2006/01/07/AR2006010701024.html>

(subscription required; full text in the [Appendix](#))

Item 4. UNEP and 150 Labor Unions Agree on Environmental Objectives

The Trade Unions' Assembly on Labour and the Environment, a joint meeting of UNEP and representatives from over 150 trade unions, set forth "a wide ranging strategy to mainstream environment and sustainable development within the trade unions movement", embodied in the "Workers' Initiative for a Lasting Legacy". The unions agreed to support the UN Millennium Development Goals, the Johannesburg Plan of Implementation, action on climate change, and promotion of sustainable production and consumption patterns. According to the UNEP announcement, "Other areas include working for the ratification and implementation of key treaties that promote important social, economic and environmental objectives alongside monitoring of governments so that their purchasing, regulation and land-use policies meet sound social and environmental targets."

Military Implications:

Military personnel officers and their civilian contractors who work with unions should seek opportunities to cooperate on improved environmental practices. This movement makes labor unions potential new allies for military R&D green materiel developers.

Sources:

Labouring Together for a Cleaner, Greener and More Just Planet

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=467&ArticleID=5078&l=en>

WILL 2006 Conference: Trade Unions Agree Action on Environment with Key UN Bodies

<http://www.icftu.org/displaydocument.asp?Index=991223286&Language=EN>

Item 5. Environmental Performance Index to Help Improve Policymaking

The Pilot 2006 Environmental Performance Index measures countries' performance relative to environmental targets, and aims to provide an analytical and empirical tool for improving policy choices. The Index is composed of 16 indicators from six policy categories: environmental health; air quality; water resources; biodiversity and habitat; productive natural resources; and sustainable energy. The indicators included in the index are: child mortality, indoor air pollution, drinking

water, adequate sanitation, urban particulates, regional ozone, nitrogen loading, water consumption, wilderness protection, ecoregion protection, timber harvest rate, agricultural subsidies, overfishing, energy efficiency, renewable energy, and CO₂ per unit of GDP. Based on the Index, the five top ranked countries are: New Zealand, Sweden, Finland, Czech Republic, and the UK. The U.S. is ranked 28th. However, the report also shows the ranking based on the components of the Index, thus providing countries useful information to review their policies and improve environmental decisionmaking. The Pilot 2006 Environmental Performance Index was developed by the Center for Environmental Law & Policy at Yale University and the Center for International Earth Science Information Network (CIESIN) at Columbia University in collaboration with the World Economic Forum and the Joint Research Centre of the European Commission and was formally released at the annual meeting of the World Economic Forum, in Davos, on January 26, 2006.

Military Implications:

The military should consider using the Environmental Performance Index or variations of it for setting goals and priorities for improved environmental sustainability. It could be used for individual bases, divisions, and/or the military as a whole.

Source:

Pilot 2006 Environmental Performance Index

<http://www.yale.edu/epi/>

Item 6 Dechlorane Plus® Detected in Atmosphere

An atmospheric monitoring network in the U.S. Great Lakes region has detected the presence of Dechlorane Plus, an organochlorine flame retardant, the limited preliminary data for which indicates that it is persistent, bioaccumulative, and potentially toxic. This is the first report of the presence in the environment of this widely used chemical. Major uses of Dechlorane Plus are in electrical wires and cables and in computer connectors. Some of its properties may be similar to those of the polybrominated diphenyl ether (PBDE) compounds already banned in Europe and in some parts of the U.S.

Military Implications:

The military should consider monitoring further research on this chemical, and be prepared for its eventual addition to the lists of controlled materials attached to international environmental protection agreements. (See also Item 10.2 *Denmark to Sue EU Over Annuling Flame Retardant Ban* in this report)

Source:

A new flame retardant in the air

Science News, January 4, 2006

http://pubs.acs.org/subscribe/journals/esthag-w/2006/jan/science/kb_dechlorane.html

Item 7. Marine Biodiversity Protection Regulations Need Improvement

Greenpeace and 17 countries have asked Japan to "cease all its lethal scientific research on whales," that seems to violate international regulations for whales' protection. Japan's scientific

research on whales caused the death of a significant number of protected species. In the first weeks of January, Greenpeace and Japanese whaling fleets have twice come into collision. Greenpeace and the Sea Shepherd Conservation Society are trying to raise international awareness to increase pressure upon Japan to stop its whaling operations. Although the Sea Shepherd Conservation Society, which was pursuing Japanese whaling operators, has said that Japan's whaling operations have been in violation of many international laws, no reprimands have been issued. It takes 75% of the International Whaling Commission's 66 members to support and make substantive changes to the International Convention for the Regulation of Whaling.

A similar case was brought forward to the UN Law of the Sea Tribunal in the case of Chile v. European Commission on the conservation of swordfish. Both parties submitted the case to the Tribunal at the international level for clarification of several aspects pertaining to marine biodiversity protection. The Tribunal extended the deadline on the proceedings until January 1, 2008.

Military Implications:

These cases show that the present regulations covering marine conservation lack an adequate enforcement system and may one day be altered. If so, then the military might at some point be asked to help in monitoring compliance.

Sources:

17 Governments Ask Japanese to Stop Antarctic Whaling

<http://www.ens-newswire.com/ens/jan2006/2006-01-19-03.asp>

Whaling Protest: Greenpeacer Knocked Overboard, Sea Shepherd Out of Fuel

<http://www.ens-newswire.com/ens/jan2006/2006-01-16-03.asp>

Whaling Battle Heats Up the Icy Southern Ocean

<http://www.ens-newswire.com/ens/jan2006/2006-01-09-05.asp>

UN Law Of Sea Tribunal Extends Deadline In Case Of Chile v. European Community

<http://www.un.org/apps/news/story.asp?NewsID=17065&Cr=Chile&Cr1=EU>

Fisheries scoreboard: Member States must do more to prevent overfishing

<http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/52&format=HTML&aged=0&language=EN&guiLanguage=en>

Item 8 New Norwegian Emergency Force Set Up

Norway has set up a special emergency force of 1,000 soldiers from the Army prepared to handle national emergency situations mainly related to terrorism, and natural and environmental catastrophes. This is the first time since the Cold War that Norway has established such a unit.

Military Implications:

If not already in planning or implementation, military personnel with environmental catastrophe missions and experience should consider cooperation with the Norwegian special force.

Source:

New Norwegian emergency force set up

<http://norwaypost.imaker.no/cgi-bin/norwaypost/imaker?id=21411>

Item 9. Repeated Spills in China Threaten Human Health and the Environment

After last November's catastrophic slick of several toxic chemicals into the Songhua River following an explosion at a petrochemical plant in China's northern Jilin Province, several new major toxic spills have threatened the environment and health of millions of Chinese in other parts of the country. One spill of diesel oil into the Yellow River forced the shutdown of 63 pumping stations cutting off the water supply to six million inhabitants of the Shandong capital city of Jinan. A cadmium spill in southern China's Guangdong province cut tap water supply to tens of thousands of people for more than a week in December, and another cadmium spill that occurred recently in Hunan was neutralized faster with less implication for the population. A field mission report by UNEP following the Songhua River spill makes several recommendations to the Chinese authorities for overcoming and coping with such incidents, including considering the implementation of a program such as UNEP's Awareness and Preparedness for Emergencies at Local Level (APELL). The report also highlights that the environmental and health implications of the spill can't be completely assessed yet.

Military Implications:

Since the Chinese government agreed to incorporate UNEP's recommendations and lessons learned from the incident into policy, legislation and enforcement, and to share the report with Russian authorities, it is likely that some regional if not international regulations and enforcement might follow. In the spirit of international cooperation, the military liaison officers in Beijing should consider contacting the Chinese State Environmental Protection Administration (<http://www.zhb.gov.cn/english>) and the People's Liberation Army, and offering assistance and advice on handling and preventing such environmental disasters. Relevant military personnel might also consider studying the UNEP report for eventual insights on consequences of such catastrophes and reaction strategies and planning.

Sources:

New Chemical Spills Threaten Water Supply For Millions In China

http://www.terradaily.com/news/New_Chemical_Spills_Threatens_Chinese_Water_Supply.html

Report from the United Nations Environment Programme Mission to China

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=467&ArticleID=5076&l=en>

Effects of China's Songhua River Chemical Spill Still Emerging

<http://www.ens-newswire.com/ens/jan2006/2006-01-13-05.asp>

Item 10. Updates on Previously Identified Issues

10.1 Carpathian Convention Comes Into Force

The Carpathian Convention came into force on January 4, 2006. Although covering just seven European countries (the Czech Republic, Hungary, the Slovak Republic, Ukraine, Poland, Romania, and Serbia and Montenegro, out of which just the first four are States parties), the Convention has considerable global importance, being seen by other regions as an example to follow. There are already requests for UNEP to expand the Convention to adjacent regions, as well as to consider designing similar treaties for other mountain regions of the world. [See also *Fifth Environment for Europe Ministerial Conference* in May 2003, and *Carpathian Mountain office of the United Nations Environment Programme* in July 2004 environmental security reports.]

Military Implications:

[Similar to previous on the same issue] The newly protected areas and new restrictions introduced by the Convention might have implications on training grounds, military base procedures, and information disclosure. The military and its contractors should be sure to comply with the requirements of the Convention in the States parties in keeping with provisions of Status of Forces Agreements when operating in the countries that have to adhere.

Sources:

Mountain Region in the Heart of Europe gets Legal Protection

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=467&ArticleID=5072&l=en>

The Convention on the protection and sustainable development of the Carpathians

<http://www.carpathianconvention.org/index.htm>

10.2 Denmark to Sue EU Over Annuling Flame Retardant Ban

The Danish government announced its intent to sue the European Commission over annulling the ban on deca-BDE, a brominated flame-retardant, since it might cause birth defects and cancer. Brominated flame-retardants are a group of chemicals used in electronic devices. The deca-BDE was to be banned starting on July 1, 2006, under the EU Restriction of Hazardous Substances (RoHS) directive, which will regulate the use in new products of certain hazardous substances—lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers (PBDE). However, in October 2005, the European Commission decided to exempt decaBDE from the RoHS Directive. [See also *Recycling Regulations in the EU* in August 2005 and *Two E-waste laws entered into force in the European Union (EU)* in February 2003 environmental security reports.]

Military Implications:

[Similar to previous Item on the same issue and related to items 6 in this report] Military commands deployed in EU Member States should be prepared to comply with the new directives and consider substitutes for hazardous substances, if not already in place. Also, they should follow developments in individual EU states, since there is not necessarily always consensus on regulation of various substances.

Sources:

Denmark to Sue EU Over Flame Retardant Linked to Birth Defects

<http://www.ens-newswire.com/ens/jan2006/2006-01-04-01.asp>

COMMISSION DECISION amending for the purposes of adapting to the technical progress the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment [see article 3]

http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2005/l_271/l_27120051015en00480050.pdf

RoHS & WEEE -- Info Guide to Compliance for the RoHS and WEEE Directive

<http://www.rohsguide.com/>

10.3 Climate Change Updates**10.3.1 Meeting of Asia-Pacific Partnership on Clean Development and Climate**

The Asia-Pacific Partnership on Clean Development and Climate, comprising Australia, U.S., Japan, India, South Korea, and China, a group accounting for about 50% of global greenhouse gas

emissions, held its meeting on January 11-12 in Sydney. The Partnership is intended to be consistent with the countries' commitment under the UN Framework Convention on Climate Change and “complement, but not replace, the Kyoto Protocol.” The six nations did not set any binding targets or regulations to cut greenhouse gases, but adopted a Charter that outlines the purposes, organization, functions, funding, and terms of the Partnership. The meeting also prepared the Partnership Work Plan that sets the framework of the partnership, based on collaboration among private, research and government organizations to accelerate the development and implementation of advanced clean and efficient technologies that would increase energy security and reduce greenhouse gases without hindering economic development. The eight public-private sector Task Forces established would be covering “(1) cleaner fossil energy; (2) renewable energy and distributed generation; (3) power generation and transmission; (4) steel; (5) aluminum; (6) cement; (7) coal mining; and (8) buildings and appliances.” The task forces will submit plans by mid-2006. It was also proposed to establish an Asia-Pacific Energy Technology Co-operation Centre, for the “development and implementation of an energy audit program and its follow-up projects.”

Military Implications:

Relevant military personnel and civilian contractors should consider being involved in the development of the Partnership Work Plan and the other actions of the Partnership, to contribute to their elaboration and use as tools and framework for policy-making to curb greenhouse gas emission and increase energy efficiency. Military operations might also benefit from new approaches brought by others to this process that might reduce the military environmental footprint.

Sources:

Asia-Pacific Partnership for Clean Development and Climate (APP)

<http://www.state.gov/g/oes/climate/c16054.htm>

Charter for the Asia-Pacific Partnership on Clean Development and Climate

<http://www.state.gov/g/oes/rls/or/2006/59162.htm>

Communiqué for the Asia-Pacific Partnership on Clean Development and Climate

<http://www.state.gov/g/oes/rls/or/2006/59158.htm>

World's Big Polluters Fund Cleaner Fossil Fuels

<http://www.planetark.org/dailynewsstory.cfm/newsid/34475/story.htm>

Why NZ wasn't at the Climate Change Conference

<http://www.scoop.co.nz/stories/SC0601/S00013.htm>

10.3.2 Global Warming Threshold Might Have Been Crossed

In the preamble to his upcoming book, 'The Revenge of Gaia', James Lovelock, who formulated the Gaia theory— a planetary system which keeps the Earth fit for life—made the astonishing statement that climate change has reached the point of no return due to humans' abuse of the environment. He argues that before the end of the century the devastating effects will be considerable, as the result of an uncontrollably accelerated process of warming mainly caused by huge emissions of greenhouse gases such as CO₂. He suggests that governments' efforts —mainly in Europe—should concentrate more on preparedness to cope with consequences of climate change than countering it. The temperature might rise 8°C in the temperate regions and 5° in the

tropics. Although some consider Lovelock's assumptions controversial, there is consensus that the situation is critical and more intense actions are needed to curb global warming. Scientists studying the Arctic are also noting that the polar region is close to or on the edge of the "no return" point. They warn about the effects that the thaw will have all over the world, not just in the north: accelerating global warming, possibly even changing the Earth's weather systems, including significantly changing Europe's climate.

Military Implications:

Public information officers of the military who might be called upon to address the military's global warming impact should read the book when it is released, as should others in the military involved in the global warming issues. [Similar to previous on this topic]: The incredible amount of research providing compelling evidence of the effects of climate change, as well as the increased number and quality of tools providing information for policy making, contribute on a daily basis to ability for increasing action to curb current environmental trends. The military and its contractors should continue to develop technologies and management procedures to reduce its environmental impact and coordinate with others on forecasting future impacts and roles for military responsiveness.

Sources:

James Lovelock: The Earth is about to catch a morbid fever that may last as long as 100,000 years by James Lovelock. *The Independent*, 16 January 2006

<http://comment.independent.co.uk/commentators/article338830.ece>

Environment in crisis: 'We are past the point of no return'

By Michael McCarthy Environment Editor, *The Independent*, 16 January 2006

<http://news.independent.co.uk/environment/article338878.ece>

Green campaigners support Lovelock for sparking fresh debate on global warming

By Michael McCarthy, Environment Editor, *The Independent*, 17 January 2006

<http://news.independent.co.uk/environment/article339066.ece>

Rapidly shrinking Arctic ice could spell trouble for the rest of the world

<http://www.realcities.com/mld/kwashington/13593302.htm>

10.3.3 Several Small Asia/Pacific Countries at Risk because of Rising Sea Levels

Possible rising sea levels of over 30 centimeters by the middle of this century would drown or make uninhabitable several small Pacific countries. Although discussions related to the implications for the region's security have begun, there are no regional and/or international policies and procedures to address displaced populations from small island countries.

Military Implications:

The military should contribute to the elaboration of a comprehensive strategy to cope with the consequences of global warming in the Pacific region and also be prepared to anticipate and react to eventual regional security-related situations that will impact all littoral zones, not just small island nations.

Source:

SOS call as island nations go under

By Cynthia Banham and Richard Macey, *The Sydney Morning Herald*, January 5, 2006

<http://www.smh.com.au/news/national/sos-call-as-island-nations-go-under/2006/01/04/1136050496795.html>

10.4 Nanotechnology

10.4.1 New Patent Office Nanotech Index Should Speed Research

The U.S. Patent and Trademark Office is about to unveil its new expanded classification schedule for its cross-reference art collection (XRAC) of Nanotechnology, Class 977, material. This schedule will have 263 new subclasses (or categories) in which nanotech-related items can be filed and organized, compared to only one massive subclass at present.

Military Implications:

Military personnel concerned with nanotechnology should become familiar with this new and detailed scheme, in order both to use it to track nanotech material in the PTO and to consider using it to organize nanotech information internally.

Source:

USPTO Poised to Ring in a New Era of Simplified Search and Better Visibility for Nano Patents
<http://www.nsti.org/news/item.html?id=35>

10.4.2 NIOSH to Form Field Research Team for Assessing Nanotechnology Processes Safety

The National Institute for Occupational Safety and Health (NIOSH) will form an interdisciplinary Field Research Team for assessing occupational health and safety practices related to nanotechnology operations. The interdisciplinary team will include researchers representing areas such as industrial hygiene, engineering, occupational medicine, and risk assessment, who will serve in limited-time assignments in the field, in those locations where nanomaterials are developed or utilized. The information and insight provided by the team will periodically update NIOSH's "Approaches to Safe Nanotechnology" on-line guidance document
www.cdc.gov/niosh/topics/nanotech/nano_exchange.html.

Military Implications:

Military personnel working with occupational safety and health applications and implications of nanotechnology should be up-to-date with NIOSH database content to ensure that all the health and safety standards and recommendations are implemented in the respective nanotech labs and processes.

Source:

NIOSH To Form Field Research Team for Partnerships in Studying, Assessing Nanotechnology Processes
<http://www.cdc.gov/niosh/updates/upd-12-28-05.html>

10.4.3 Managing the Effects of Nanotechnology

Managing the Effects of Nanotechnology by J. Clarence (Terry) Davies, is a comprehensive overview of the existing legal framework that would apply to nanotechnology, and outlines aspects that should be covered by new regulations. The author notes the need for a "right regulatory framework for nanotechnology--framework that encourages initiative and innovation, while also protecting the public and the environment."

Military Implications:

Relevant military personnel should study the report, since it is likely that some of the recommendations will find their way into an updated legal framework concerning nanotech-related practices.

Source:

Managing the Effects of Nanotechnology

http://www.wilsoncenter.org/index.cfm?fuseaction=events.event_summary&event_id=162112

10.4.4 Buckyballs no Risk to DNA

Reacting to last month's remarks on possible dangers that "buckyballs" could present to human DNA, Dr. Hicham Fenniri, senior researcher at the National Institute for Nanotechnology in Edmonton, Canada, comments that there are no such risks. He explains that since buckyballs are not soluble in water, it would be difficult for them to reach the DNA to damage it. [See also *Buckyballs Could Damage DNA* in December 2005 environmental security report.]

Military Implications:

This is one more position to be added to others concerning nanotechnology health and safety issues for military personnel with such research responsibilities. The jury is still out.

Source:

Buckyballs no cause for alarm

By Eliza Barlow, *Edmonton Sun*, January 3, 2006

<http://www.edmontonsun.com/News/Edmonton/2006/01/03/1376977-sun.html>

10.4.5 DNA-Wrapped Nanotube Sensors

Trace amounts of harmful contaminants can be found inside the body via single-walled carbon nanotubes wrapped with DNA and placed inside living cells. Ions of atoms such as calcium, mercury and sodium in contact with DNA neutralize its negative charges, changing its shape. This reduces the frequency of the nanotube's fluorescence indicating how many ions have bound to the DNA. "We found that the thermodynamics that drive the switching back and forth between these two forms of DNA structure would modulate the electronic structure and optical emission of the carbon nanotube," said Michael Strano, a professor of chemical and biomolecular engineering at the University of Illinois at Urbana-Champaign.

Military Implications:

This process should be added to others being studied by the military for use in early warning of biological attacks. Its safe use in humans and other animals should also be assessed.

Source:

Optical Detection of DNA Conformational Polymorphism on Single-Walled Carbon Nanotubes

<http://www.sciencemag.org/cgi/content/abstract/311/5760/508>

10.5 Safe Toxin Levels Unknown

A recent paper in the journal *Public Library of Science - Medicine* reported that a review of the epidemiological data shows that there is no clearly safe level of exposure to four of the most common environmental toxins - lead, radon, tobacco smoke and such byproducts of

drinking-water disinfection as the trihalomethanes. The general practice has been "to assume that there is no safe level of exposure to carcinogens and use linear dose-response models to estimate human health risks at low exposure levels ... [but] that a threshold, or 'safe', exposure level exists for noncarcinogens." If further work confirms the conclusion of this study that the non-carcinogen part of that assumption is incorrect, there may be substantial changes in the international regulatory approach to environmental pollutants. [See also *EU and Japan Respond to Risks from Low Dose Chemicals* in the August 2005 environmental security report]

Military Implications:

The military should carefully follow progress in this line of research, and be prepared for moves to strengthen the parts of international agreements dealing with non-carcinogenic environmental pollutants.

Sources:

Safe levels of major toxins unknown

<http://europa.eu.int/comm/environment/integration/newsalert/pdf/2na1.pdf>

Wigle D.T. & Lanphear B.P. (2005) "Human health risks from low level environmental exposures: no apparent safety thresholds", *PLoS Medicine* 2(12)

<http://medicine.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pmed.0020350>

10.6 Sandia Advancing Research on Batteries' Life and Safety

As part of the Department of Energy-funded FreedomCAR program, Sandia National Laboratories' Power Sources Technology Group is researching ways to make lithium-ion batteries work longer and more safely. According to an SNL news release, the research could lead to these batteries being used in new hybrid electric vehicles in the next five to ten years. The work is centered on developing a higher degree of abuse tolerance in the batteries. Another project at Sandia is studying key phenomena that affect the durability and byproduct management of hydrogen-fueled PEM (proton exchange membrane or polymer electrolyte membrane) fuel cells, which are also important candidates as components for advanced vehicles. [See related item *Update on more efficient vehicles: Program of the FreedomCAR and Fuel Partnership* in July 2005 environmental security report.]

Military Implications:

The military should follow these researches and, considering their importance in the effort to reduce emissions, try to find ways to help accelerate their development and implementation with due regard for health and environmental safety considerations.

Sources:

Sandia researchers seek ways to make lithium-ion batteries work longer, safer

<http://www.sandia.gov/news-center/news-releases/2006/all/battery2.html>

Sandia researchers collaborate to understand phenomena controlling PEM fuel cell performance, durability

<http://www.sandia.gov/news-center/news-releases/2006/all/fuelcell.html>

Item 11. Reports to Review

11.1 *State of the World 2006*

The Worldwatch annual report is a comprehensive overview and analysis of the world situation from the point of view of resources, biodiversity, population, and economic growth, and their impact on the world's ecosystems. This year's report has a special focus on the two fastest growing economies and most populated region: China and India. The report highlights the huge impact that the policies and paths of development of these two countries has on the whole globe from all points of view, even to the point of being a determinant for a better or catastrophic future.

Military Implications:

The report is an excellent source of information for anyone interested in a good picture of humanity's footprint on the ecosystem, and of trends, and possible future developments.

Source:

State of the World 2006: China and India Hold World in Balance

<http://www.worldwatch.org/press/news/2006/01/11/>

11.2 North American Report on Children's Health and Environment Indicators

Children's Health and the Environment in North America is the first ever report analyzing the link between children's health and environmental quality. The report considers 13 indicators under three thematic areas: asthma and respiratory disease; effects of exposure to lead and other toxic substances; and waterborne diseases, finding that only one of the indicators, addressing asthma, was fully reported by all three countries, Canada, Mexico and the U.S. Highlighting that children are at higher risk by exposure to environmental pollution than are adults, the report recommends better data collection and reporting, for improving public policy in this area. The report is the result of a joint effort of The Commission for Environmental Cooperation, the International Joint Commission, the Pan American Health Organization, the World Health Organization (WHO), and the governments of Canada, Mexico and the United States.

Military Implications:

It is likely that the report will be used to improve policies related to environmental pollution and it might trigger new reporting and/or stricter regulations concerning some pollutants that might be found harmful to children's health.

Source:

Children's Health and the Environment in North America

http://www.cec.org/pubs_docs/documents/index.cfm?varlan=english&ID=1917

APPENDIX

Reference Details

This Appendix contains the full text for the articles that are not available on the Internet or are usually stored for a limited time on the respective Web sites.

Item 2. China and India Sign Precedent-Setting Energy Agreement

China, India sign energy agreement

(China Daily/AFP) Updated: 2006-01-13 05:46

http://www.chinadaily.com.cn/english/doc/2006-01/13/content_511871.htm (article stored for a limited time on the website)

China and India signed a slew of co-operation pacts in the hydrocarbon sector yesterday to ensure secure energy supplies.

In the "Memorandum for Enhancing Cooperation in the Field of Oil and Natural Gas" signed yesterday between Mani Shankar Aiyar, the visiting Indian petroleum and natural gas minister, and Ma Kai, director of China's National Development and Reform Commission, both sides identified key areas for partnerships.

They include upstream exploration and production, refining and marketing of petroleum products and petrochemicals, research and development, conservation, and promotion of environment-friendly fuels.

The agreement also allows trading in oil and joint bidding in third countries that will help both nations reduce the burden on the exchequers.

"We look upon China not as a strategic competitor but as a strategic partner," said Aiyar at a news conference at the Indian Embassy in Beijing last night.

"Both China and India recognize that unbridled rivalry between them only results in the seller of the assets being benefited irrespective of which of the two countries wins the bid," Aiyar told reporters on Thursday.

"Therefore it does make sense ... to have circumstances in which India and China march shoulder to shoulder."

He added: "I don't think it is necessary for either India or China to purchase its energy security at the expense of the other."

Such cooperation would be subject to information sharing between governments and companies that could facilitate later commercial decisions, Aiyar said.

The agreement calls for the establishment of a joint committee to monitor implementation and facilitate dialogue and information sharing not only in purchasing energy but in "the full spectrum of the hydrocarbon chain," he said.

Aiyar said it would take a year to see how the agreement worked, but he was fully confident that the two energy-hungry nations could cooperate as they sought global energy assets to fuel their booming economies.

"We will see from practical experiences the advantages of going at it together rather than separately," he said.

Besides the memorandum, five commercial agreements were also signed between Indian and Chinese firms, Aiyar said.

His three-day visit, which started on Wednesday, comes at a time when the two countries have emerged as significant consumers of hydrocarbon resources.

Over the past year, there have been a number of occasions when Indian and Chinese companies publicly competed for the same assets, such as in Angola, Kazakhstan and Ecuador.

That rivalry was highlighted this week when China National Overseas Oil Corp (CNOOC) announced its purchase of a 45-per cent stake in the Akpo field off the Nigerian coast for US\$2.3 billion.

Aiyar's trip has raised expectations that China and India which rely heavily on energy imports to power their economies will put aside their competing strategies to work together.

"Co-operation between India and China in third countries is not only eminently desirable; it is also entirely feasible," Aiyar said.

Three Chinese firms including Sinopec and CNOOC Limited have joined hands with their Indian counterparts.

Take your partners

From The Economist print edition, Jan 19th 2006

http://www.economist.com/research/articlesBySubject/displayStory.cfm?story_id=5420659&subjectID=381586&fsrc=nwl&emailauth=%2527%252E5%252F4Q%252CKH%2521A%25244%250A (by subscription only)

China, India and the oil market

THE global scramble by China and India for oil assets abroad started to worry western oil majors last year. Egged on by governments concerned about energy security, once-irrelevant Asian

energy firms gobbled up oil and gas everywhere from Ecuador to Canada to Kazakhstan. China's CNOOC even made an audacious (although ultimately unsuccessful) \$18.5 billion bid for America's Unocal. But the setback has not dented CNOOC's ambitions. The company has just announced a successful \$2.25 billion deal for oil and gas assets in Nigeria. There are market rumours that the same Chinese firm is now looking to snap up Nations Energy, a Canadian firm with assets in Central Asia, for a further \$2 billion. The new king of Saudi Arabia has just announced that his first trip abroad will be to China and India.

Western majors, which are already finding it hard to replace their oil reserves, see the emergence of new Asian rivals as a sign of trouble ahead. And the past few weeks have raised the spectre of a force even more threatening than China and India competing to buy assets: the insecure giants working hand in hand.

Given the historical animosities between the two countries, that may seem unlikely. But Mani Shankar Aiyar, India's petroleum minister, signed a series of energy co-operation agreements during a visit to China this month. Mr Aiyar proclaims that, from now on, the two countries will see each other less as strategic competitors than as strategic partners.

The Indians have an interest in working with Chinese oil firms because, in recent years, they have been consistently bested by their richer neighbour. Over the past couple of years, Chinese companies edged out Indian ones in Ecuador, Kazakhstan, Angola and Indonesia. But why would the Chinese bother to co-operate with the Indians? Geopolitical machinations offer one possible reason. America has recently cosied up to India, offering it nuclear technology and other carrots. It may suit China to offer the Indians some rival attractions, by jointly bidding for assets in Iran, Myanmar and other countries that are out of favour with America.

Co-operation would also make some financial sense. During last year's bidding for PetroKazakhstan, a Canadian outfit with lucrative oil assets in Central Asia, the Chinese paid a premium of perhaps \$500m to see off a rival Indian bid. And there is evidence that co-operation is more than just talk. As if timed to silence critics before the ministerial love-in, India's ONGC Videsh and China's CNPC announced last month that a joint bid had secured a stake in an oil field in Syria—not exactly America's favourite ally.

But while the two countries will work together when it suits them, they will also continue to pursue their energy interests separately as well. The Chinese have their African and Central Asian deals. And India's ONGC has just agreed to work closely with Shell to develop and produce oil across the world. In the new oil world there will be no clear dividing line between rivals and partners.

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Item 3. International Year of Deserts and Desertification—2006

In Kenya, 'Why Does This Keep Happening?'

By Emily Wax, Washington Post Foreign Service, January 8, 2006; Page A20

<http://www.washingtonpost.com/wp-dyn/content/article/2006/01/07/AR2006010701024.html>

(subscription required)

NAIROBI, Jan. 7 -- On New Year's Day, groups of angry Masai herders attempted to drive their emaciated cattle onto the manicured lawns of the presidential residence so their animals could graze on the thick carpets of green grass in the morning sun.

With a drought turning their fields and pastures into dusty gray wastelands, and with millions of people in the region facing a food shortage, the herders wanted to make a point, organizers of the action said.

"Africa is not so poor that it doesn't have enough food or grazing land to feed itself. There's plenty of food here," said Ben Ole Koissaba, a leader of the Masai, one of the largest and most powerful tribes in Kenya. "Many countries around the world face drought, but people don't starve. We think it's ludicrous for the government to treat its citizens this way. Why does this keep happening?"

Many are asking that question as yet another drought threatens lives and destroys crops and livestock here. About 11 million people in Kenya, Ethiopia, Djibouti and Somalia are "on the brink of starvation," the United Nations said this week. In northeastern Kenya, at least 40 people, most of them children, have died from malnutrition and related illnesses since December, according to the Kenya Red Cross.

Enough food is grown in Kenya to feed all of its population of 33 million, but many citizens, especially the country's poor subsistence farmers, cannot afford it. When the rains ceased last year, the farmers were left with parched crops, hungry livestock and nothing to eat.

"The month of December 2005 will be remembered for a long time to come by Kenyans as a time when people were starving to death while others were feasting," said Gullet Abbas, secretary general of the Kenya Red Cross Society.

Feeding centers for children younger than 5 are filling up in northern Kenya, Abbas said. Cattle, goats and camels are growing thin. On Thursday, 3,000 herdsman moved their 20,000 head of cattle across the border into Uganda to look for green pastures, according to reports on national television. Governments have warned that power shortages are possible because of lower water levels at Kenyan and Tanzanian dams, which the countries depend on to generate electricity.

"The current drought is more severe at most locations than the droughts of 1984, 1999 and 2000," Joseph Mukabana, director of the Kenya Meteorological Department, said in a full-page paid commentary in the Daily Nation, Kenya's largest newspaper. "Food relief efforts may need to go beyond December 2006 in some parts of the country."

Late Friday, President Mwai Kibaki ordered the government to purchase "all available" corn in the country in an emergency operation to stave off more deaths. The cabinet has "termed as the country's current number one priority the provision of food for Kenyans," Kibaki's office said in a statement.

The Kenya Red Cross Society and the Famine Early Warning Systems Network, a monitoring group, have criticized the government for failing to do more to prepare for the drought, saying that officials knew more than a year ago that such conditions would develop.

Some experts predict that the cycles of drought and food shortages will continue on the world's poorest continent until governments here develop more permanent, sustainable solutions.

"During these emergencies, we don't talk enough about development and what really needs to happen here," said Nancy Mutunga, the country director for the Famine Early Warning group. "Shouldn't we be building more water irrigation systems and developing more long-term solutions so this doesn't keep happening every few years?"

"If we don't talk about underdevelopment, we may just carry on with these cycles affecting herding and farming households every few years," she said. "These families are poor and live on the edge. Their wealth is dependent only on their livestock and crops. They have to diversify that."

Kibaki has asked the international community for more food aid. The U.S. Embassy, which contributed 62,890 metric tons of relief food last year, said it was eager to help again.

Too much food aid, however, can cause the price of locally grown food to fall, leaving farmers without enough income to purchase seeds for the next season, experts say.

"Making food available for the farmers, though welcome, is short-term and short-lived," said Tom Kagwe, who writes about famines and development in Africa for the Daily Nation. "It cannot provide the long-term solutions to the country's food shortage."

There are many reasons for food shortages in Africa. Sometimes war plays a role. In rebel-controlled eastern Congo, for instance, thousands of banana and mango trees produce more fruit than local people can consume. But the excess food never makes it to markets or drought-stricken regions because the roads are destroyed and armed militiamen loot the supplies or tax them heavily.

In northern Uganda, people displaced by fighting between the government and the Lord's Resistance Army, a rebel group, languish in camps, looking out at the land they used to farm. Fields that once produced abundant amounts of yams, peanuts and corn are barren.

In Kenya, a peaceful and stable country, development has been hindered by corruption and mismanagement, according to Transparency International, a watchdog group that ranks Kenya as one of the most corrupt countries in the world.

Ole Koissaba, the Masai leader, said he was furious that the president turned the herders away from his residence. Even former president Daniel arap Moi, an authoritarian leader who ruled for 24 years, allowed the Masai to graze their cattle near the state house during a drought of 2002, Ole Koissaba pointed out.

"The new leadership cares more about politics than pastoralists, and now it can't do the correct things to save the lives, long term, of its own citizens," he said, adding there should be more international pressure on African governments to develop sound agricultural policies. "No African wants things to stay in this cycle of dysfunction."

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